

# PATENT ABSTRACTS OF JAPAN

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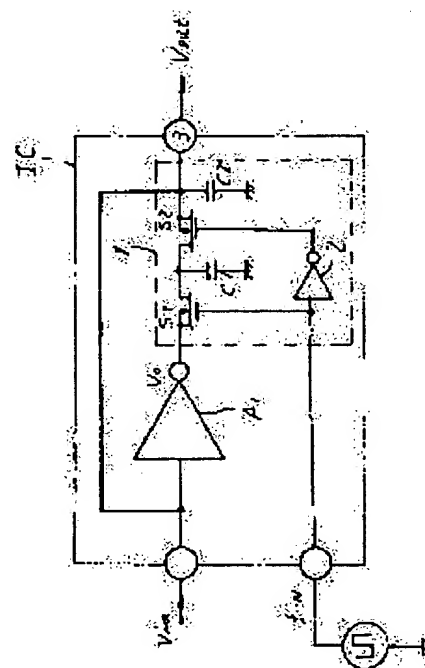
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## (54) FREQUENCY CONVERTING CIRCUIT

### (57)Abstract:

**PURPOSE:** To perform frequency conversion with simple circuit constitution by providing a time constant circuit whose time constant is varied by a control signal to a feedback circuit of an amplifier.

**CONSTITUTION:** The feedback circuit of the amplifier A1 is provided with a switched capacitor filter (SCF)1 whose time constant is varied by a frequency of control signal  $f_{in}$  so as to change the frequency of a feedback signal in response to a frequency of the control signal thereby attaining frequency conversion. Since the switched capacitor acts equivalently like a resistor having a resistance  $R=1/f_{in} \cdot C$  in the SCF1, when the frequency of the control signal  $f_{in}$  is small or large, the resistance value of the switches S1, S2 is respectively large or small. Thus, the time constant changes by varying the pulse width of the signal  $f_{in}$ , that is, the frequency. When the control signal  $f_{in}$  is changed into a low frequency in this state, the time constant of the SCF1 is large, the frequency of an output signal  $V_{out}$  is decreased and a frequency ( $f_{in} > V_{out}$ ) is obtained. Further, when the signal  $f_{in}$  is varied into a high frequency, the frequency signal ( $f_{in} < V_{out}$ ) is obtained.



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